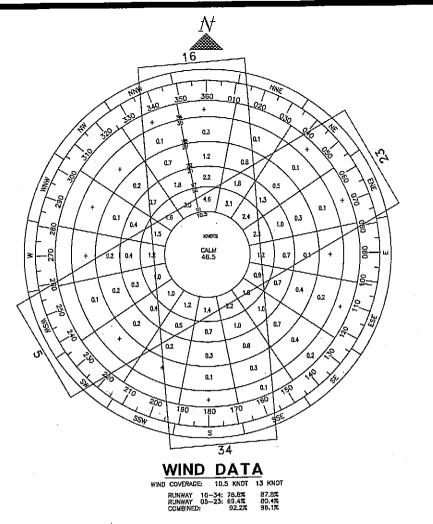


VICINITY MAP

S 29, 30, 31, & 32 R 86 W, T 1 N SEWARD MERIDIAN USGS QUAD BAIRD INLET (A-6 & 7)

NOTE: ELEVATIONS SHOWN ON THIS MAP ARE IN FEET.

O CONVERT FROM	то	MULTIPLY BY
STATION (1000 METERS)	FEET	3280.84
KILOMETER (km)	MILE	0.6214
METER (m)	MILE	0.00062137
METER (m)	FOOT	3.28084
MILLIMETER (mm)	FOOT	0.00328084
MILLIMETER (mm)	INCH	0.3937008
SQUARE METER (m ²)	SQUARE FOOT	10.76391042
SQUARE METER (m ²)	SQUARE YARD	1.19599
HECTARE	ACRE	2.4711
CUBIC METER (m3)	CUBIC FOOT	35. <u>3146</u> 667
CUBIC METER (m3)	CUBIC YARD	1.3079506
CUBIC METER (m3)	GALLON (US LIQUID)	264.17204
CUBIC METER (m3)	M. GAL.	0.26417204
KILOGRAM (kg)	POUND-MASS (LBM)	2.2046225
MEGAGRAM (Mg)	TON (SHORT)	1.10231
NEWTON (n)	POUND-FORCE (LBF)	0.2248089
LUX (Ix)	FOOTCANDLE	0.092903
DEGREE CELSIUS (°C)	DEGREE FAHRENHEIT (*F)	TF=(1.8 x TC)+32



CONDUCTED BY: LIAF WATER RESEARCH CENTER FERIOD: MARCH 1996 TO JUNE 1898

NONSTANDARD	C	ONDIT	IONS	
ПЕМ		PROPOSED	STANDARD	ULTIMATE
		 		
				<u></u>
	-			

NOTE: METRIC DIMENSIONS ARE IN ACCORDANCE WITH FAA AC 150/5300-13. ENGLISH UNIT CONVERSIONS AND EQUIVALENT DIMENSIONS ARE AS DIRECTED BY THE AC'S, EXCEPT LENGTHS WHICH ARE EXACT CONVERSIONS ROUNDED TO NEAREST TEN FEET.

BASIC	DATA	TABL	E _.		
RI	JNWAY DAT	ΓA	*		
	RUNWAY 16-34 RUN		RUNWA	AY 5-23	
ПЕМ	PROPOSED	ULTIMATE	PROPOSED	ULTIMATE	
EFFECTIVE GRADE	0.14%	SAME	N/A	0.24%	
Z WIND COVERAGE	87.8%	SAME		80.4%	
INSTRUMENT RUNWAY	NONE	NPI		NPI	
RUNWAY SURFACE	GRAVEL.	SAME.		GRAVEL	
PAVEMENT STRENGTH (LBS.)	N/A	SAME		N/A	
APPROACH SURFACES	34:1	34:1	,	34:1	
VISIBILITY MINIMUM	1600m	SAME		1600m	
RUNWAY LIGHTING	MIRL	SAME		MIRL	
RUNWAY MARKING	NONE	SAME		NONE	
NAVIGATION AIDS	ROT, BEACON	SAME		NONE	
RUNWAY SAFETY AREA DIMENSION	36m x 1094m		<u> </u>	36m x 904m	
	(120' x 3590')			(120' x 3000')	
RUNWAY DIMENSION	23m x 950m			23m x 750m	
	(75' x 3120')			(75' x 2500')	
RUNWAY OBJECT FREE AREA DIMENSION	120m x 1094m			120m x 904m	
	(400' x 3590')		<u> </u>	(400' x 3000')	
RUNWAY OBSTACLE FREE ZONE DIMENSION	120m x 1070m		ļ	120m x 880m	
	(400' x 3510')			(400' x 2890')	
TAXIWAY SAFETY AREA DIMENSION	24m		ļ	ļ	
	(79')				
TAXIWAY OBJECT FREE AREA	40m		<u> </u>		
	(131')		L	<u> </u>	

BASIC DATA	TABLE	=	
AIRPORT DAT	Ά		
ITEM		PROPOSED	ULTIMATE
NRPORT ELEVATION (M.S.L.)		16.488កា	17.663m
NRPORT REFERENCE POINT (A.R.P.) (NAD 83)	LAT.	N 601	28'15"
R/W 16-34 STA 1+541.23, 92.264 RT.	LONG.	W_164*	16'39"
FAXIWAY LIGHTING		MITL	MITL
RAMP LIGHTING		FLOOD	FLÓOD
MEAN MAX, TEMPERATURE, HOTTEST MONTH (JULY)		14.9°C (58.8°F)	SAME
AIRPORT REFERENCE CODE		B-I	8-1
AIRPORT AND TERMINAL NAVIGATION AIDS		GPS, REILS, PA	API. AWOS
GEODETIC POSITIONS (NAD 83)			
THRESHOLD 16 STA. 1+950	LAT.	N 60'08'27.81"	SAME
	LONG.	W 164°15'46.25'	SAME
THRESHOLD 34 STA. 1+000	LAT.	N 60'07'57.16"	SAME
	LONG.	W 164'16'43.02'	
THRESHOLD 5 STA. 10+000	LAT.	NONE	N 50'08'11.79"
	LONG.	NONE	W 164'16'53.35"
THRESHOLD 23 STA. 10+760	LAT.	NONE	N 60'08'23.51"
	LONG.	NONE	W 164'16'10.08'

THE GEODETIC COORDINATES FOR THE THRESHOLDS AND THE A.R.P. WERE CALCULATED FROM SURVEY CONTROL
TIES TO NGS CONTROL MONUMENT "TERN 2". THE ALASKA STATE PLANE GRID BEARING FOR RUNWAY 16-34 IS
N 4"30"00" W.

LEGEND		
ПЕМ	PROPOSED	ULTIMATE
PROPERTY LINE		SAME
BUILDING RESTRICTION LINE	·	SAME
AIRPORT REFERENCE POINT (A.R.P.)		• <u>• </u>
LIGHTED WIND CONE AND SEGMENTED CIRCLE	(7)	SAME
CONTOURS	10	SAME
ROADWAYS		===:
BUILDINGS		SAME
ROTATING BEACON	<u>>€</u>	SAME
PONDS		SAME
CONSTRUCTION		
RUNWAY VISIBILITY ZONE	222	SAME
	- 	
	·	

METRIC

AIRPORT LAYOUT PLAN APPROVED
BY LETTER DATED: Ling 27 1999

AIRPORTS DIVISION,
ALASKAN REGION, AAL—610
AIRSPACE REVIEW # 99AAL—033NRA

DATE REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
CENTRAL REGION

APPROVED: LEW VILLE PESSON SECTION CHEP
PATRICINA D. MILETE PE

ENGINEERING MANAGET

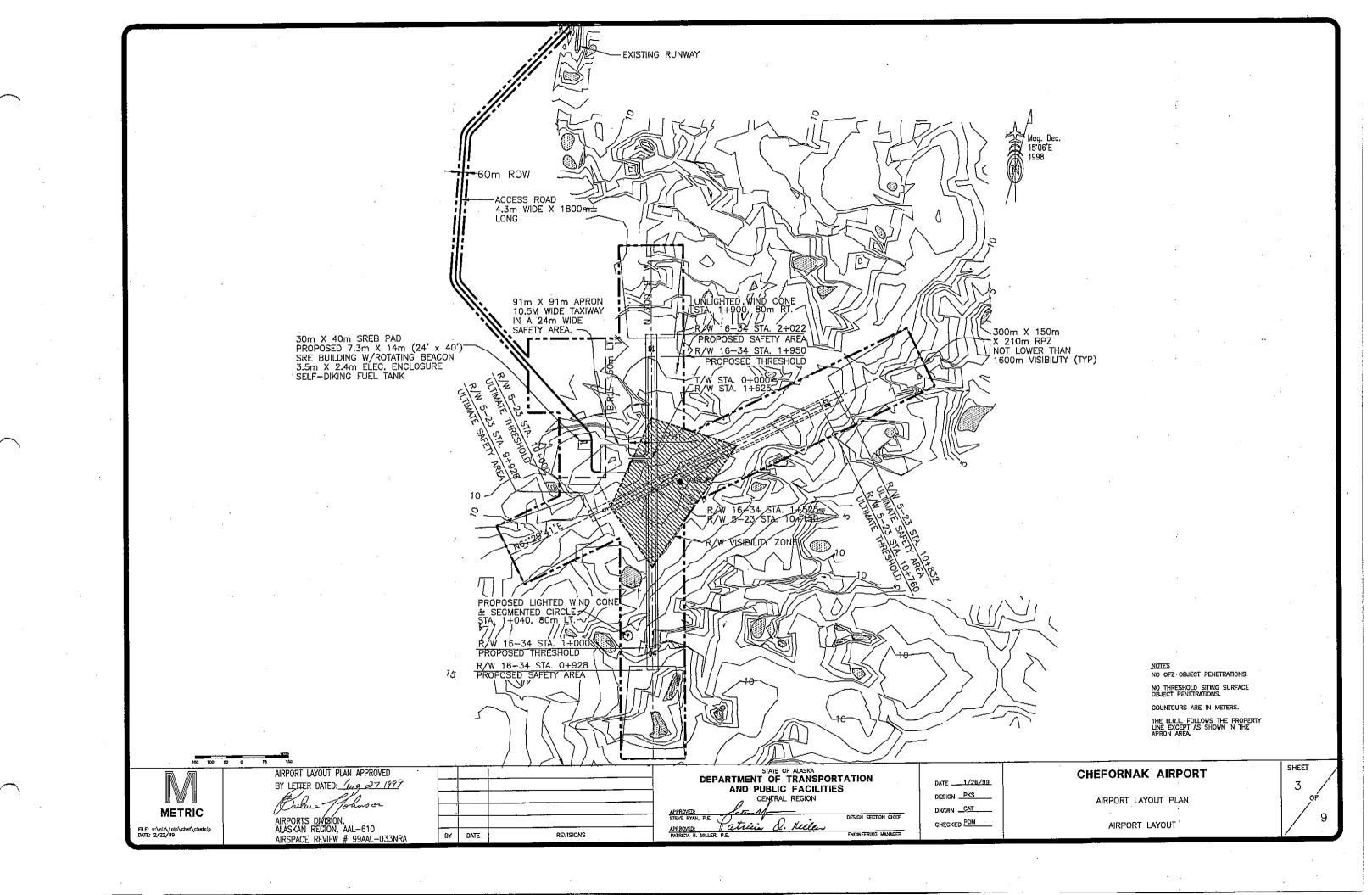
ENGINEER

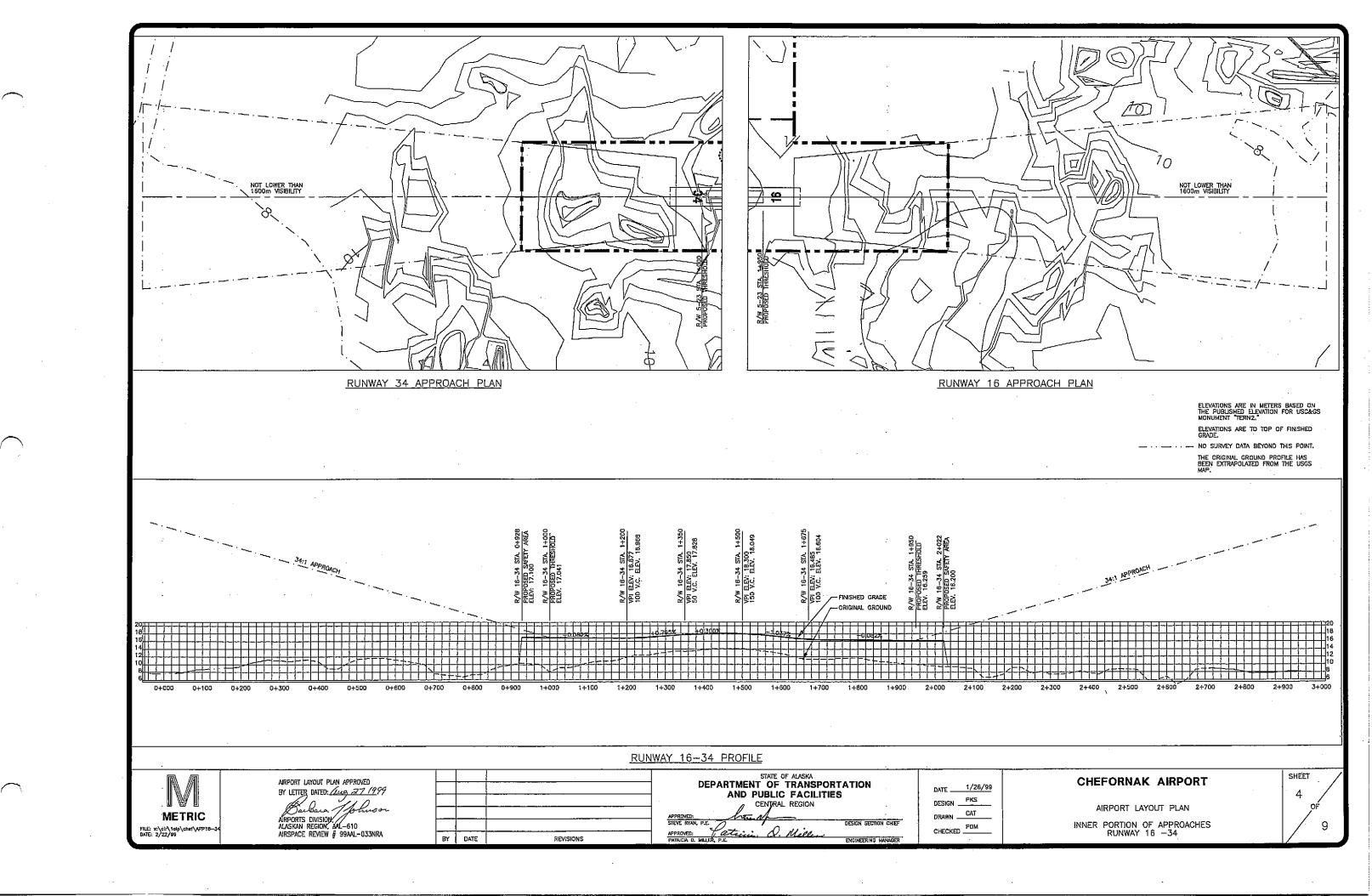
CHEFORNAK AIRPORT

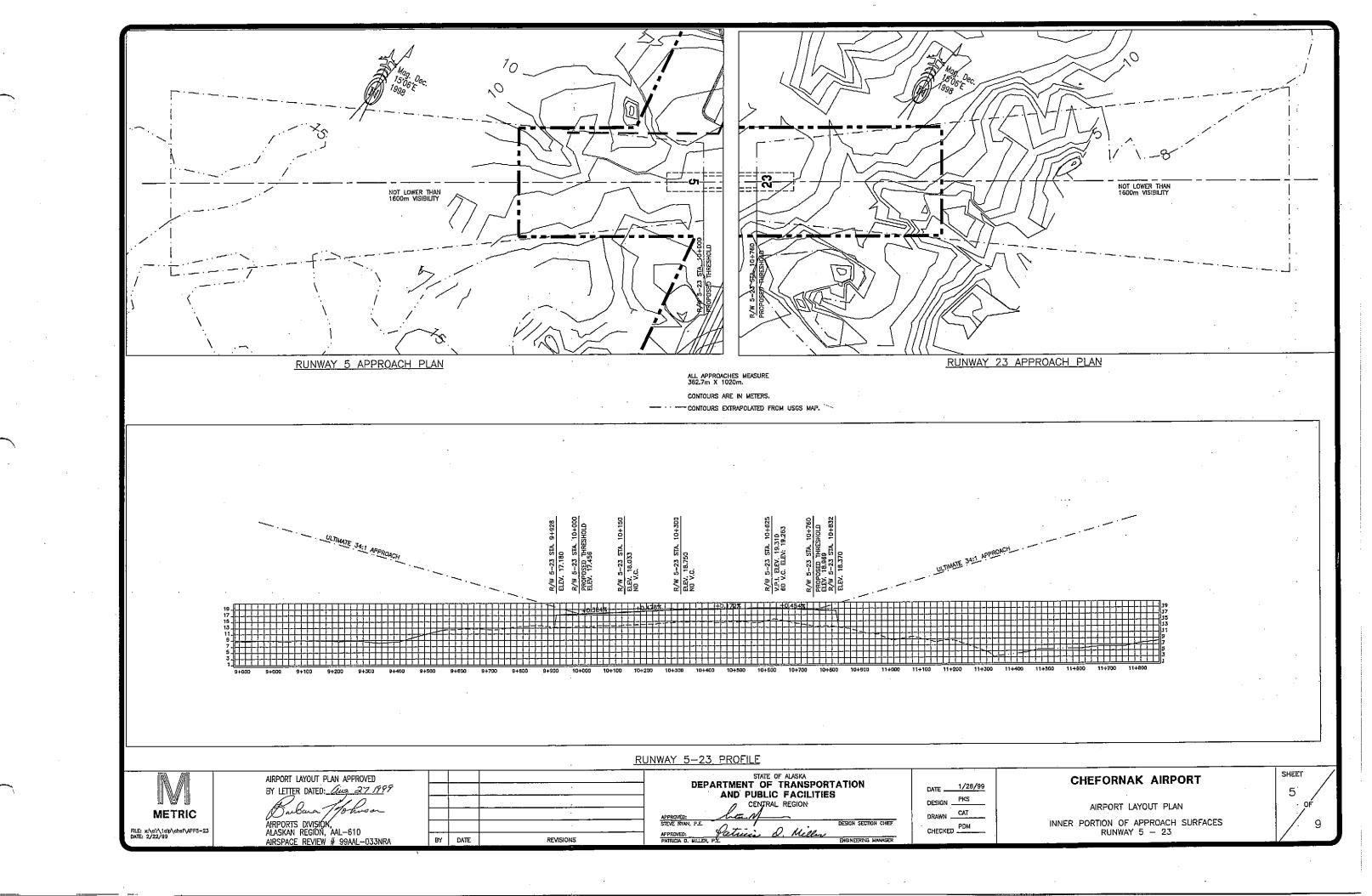
AIRPORT LAYOUT PLAN

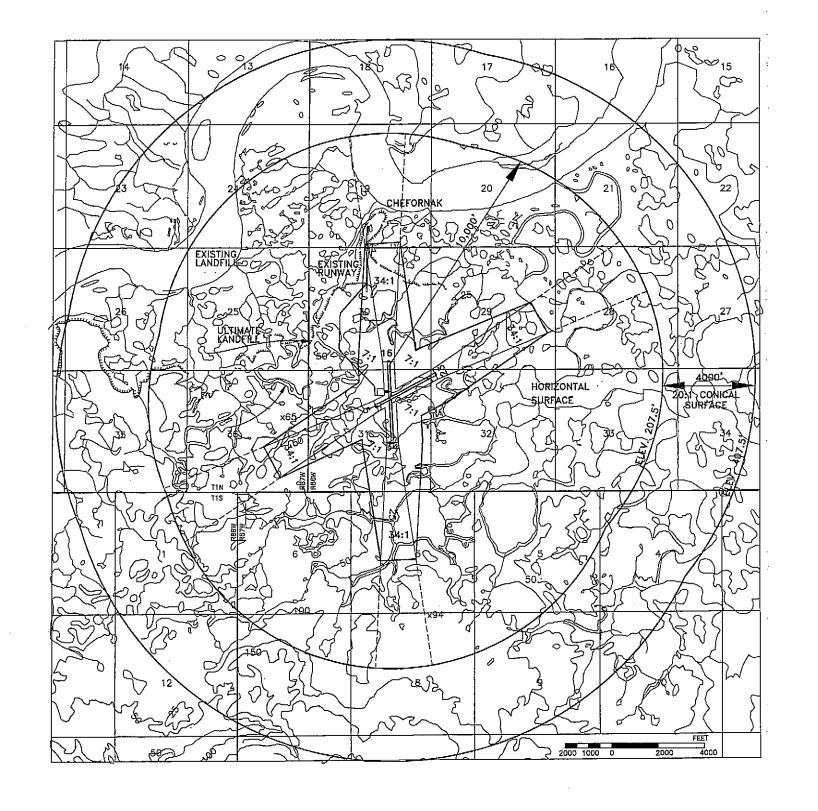
SHEET 2

9











THRESHOLD ELEVATIONS IN FEET

R/W 16 THRESHOLD ELEV. = 53.34' R/W 34 THRESHOLD ELEV. = 55.91' R/W 23 THRESHOLD ELEV. = 62.23' R/W 5 THRESHOLD ELEV. = 57.27'

NOTES:
AIRPORT ELEVATION IS 57.5'
ALL CONTOURS ON THIS SHEET ARE IN FEET.
THERE ARE NO AIRSPACE OBSTRUCTIONS.

S 29, 30, 31, & 32 R 86 W, T 1 N SEWARD MERIDIAN USGS QUAD BAIRD INLET (A-6 & 7)

METRIC
exclair\101p\chaf\chaf\chaf\pt77

AIRPORT LAYOUT PLAN APPROVED
BY LETTER DATED: Aug. 7 1999
Sourbara Johnnan
AIRPORTS DIVISION,
ALASKAN REGION, AL-610
AIRSPACE REVIEW # 99AAL-033NRA

EY DATE REVISIONS

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION

AND PUBLIC FACILITIES

CENTRAL REGION

APPROVED:

STEVE RYAN, P.E.

DESKIN SECTION

APPROVED:

PATRICIA D. MILLER, P.E.

STATE OF ALASKA

DESKIN SECTION

APPROVED:

DESKIN SECTION

APPROVED:

DESKIN SECTION

APPROVED:

DESKIN SECTION

APPROVED:

DESKIN SECTION

DATE 1/26/99
DESIGN FKS
DRAWN CAT
CHECKED PDM

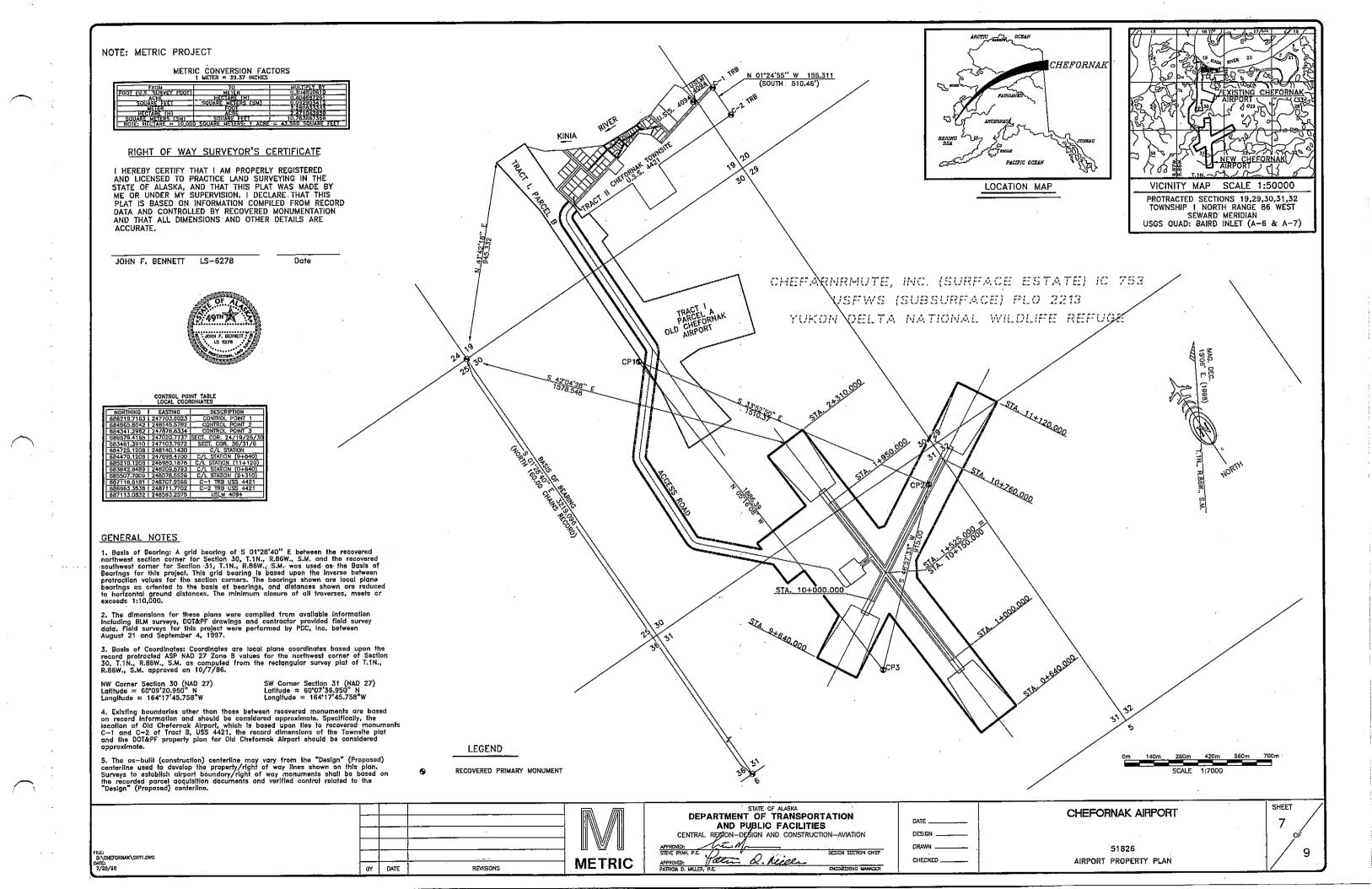
CHEFORNAK AIRPORT

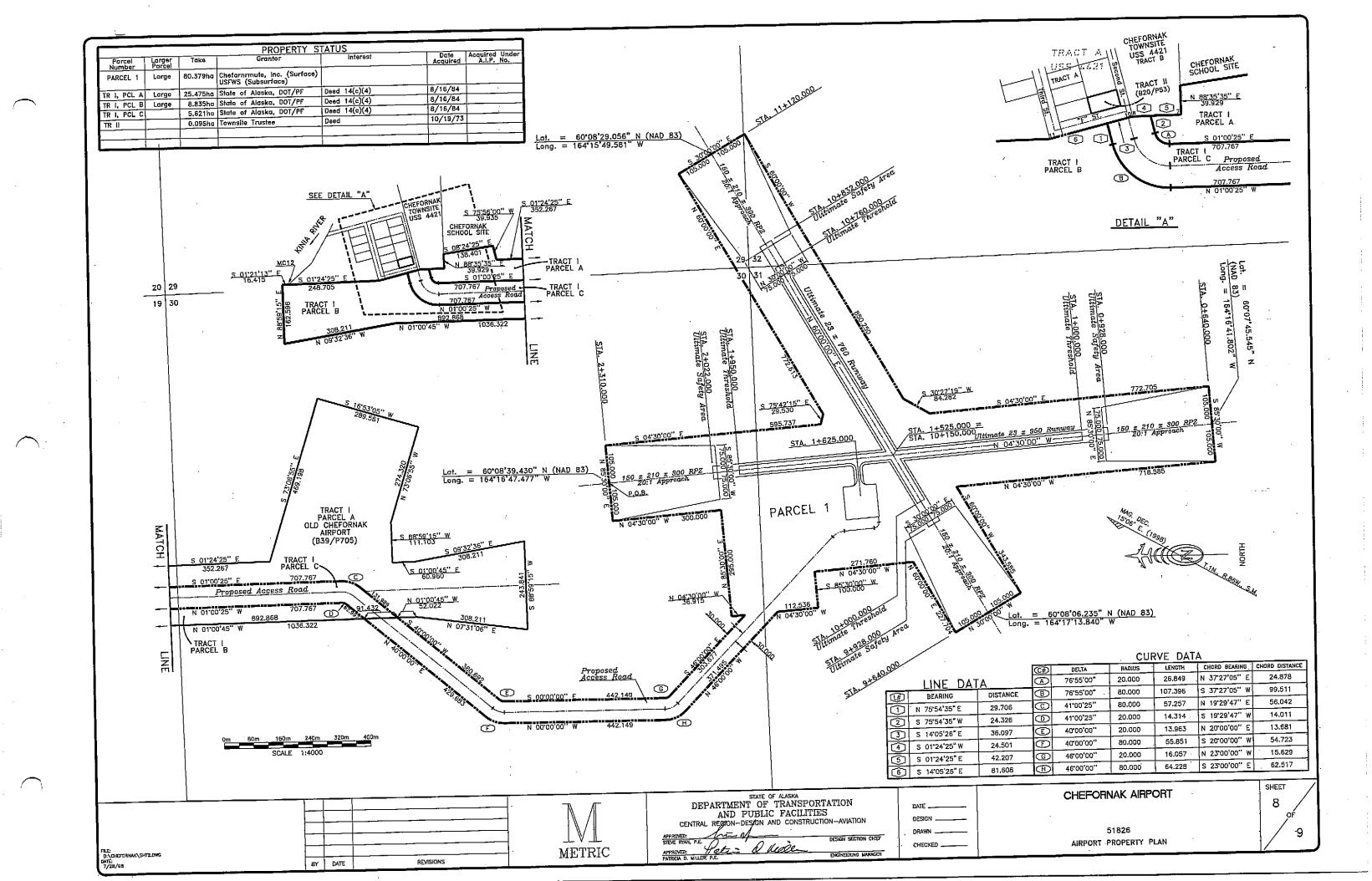
AIRPORT LAYOUT PLAN

F.A.R. PART 77 SURFACES

SHEET
6

9





A. PURPOSE

This Chefornak Airport Layout Plan Narrative Report is included with the Airport Layout Plan in accordance with Federal Aviation Administration (FAA) Airport Design Advisory Circular 150/5300—13, Appendix 7. The design of this project is being done in SI (metric) units and all measurements and units are in accordance with ASTM E 380—93. The rationale for improvements on the Chefornak Airport is outlined in this report.

B. INTRODUCTION

Located in southwestern Alaska, Chefornak lies approximately 158 kilometers [98 miles] southwest of Bethel. It is located on the south bank of the Kinia River near its junction with the Keguk River within the Yukon-Kuskokwim Delta area of southwest Alaska. The local population as of 1997 is 405 according to Department of Labor's Alaska Population Overview. Subsistence use of the land's resources is supplemented by modern day amenities. Because no roads link Chefornak with other areas of the state or supply centers, the community relies almost exclusively on air transportation. Barge service from Seattle and Bethel deliver bulk items to Chefornak; all other supplies are delivered via air. Air service is the primary means for residents to travel between other communities and larger cities that offer services not available at home. Local air taxi operators serving Chefornak are based primarily in Bethel.

C. AIRPORT USE AND FORECASTS

The Alaska Aviation System Plan (AASP) has designated this airport as community class which is defined as the primary access to a small, rural community of at least 25 permanent year round residents without reliable alternate year round access.

A user survey was conducted in 1996 to obtain annual operations. Local air taxi operators serving Chefornak were surveyed to obtain this information. The data obtained indicates annual operations slightly exceed 3,300. Enplanement data (defined as passengers on scheduled flights) between 1990 and 1996 (most current data available) indicates that passenger traffic increased 46% during the last six years (from 1,816 to 3,379). This data is obtained from the FAA ACAIS Database. During this same period population increased from 320 to 387, or approximately 17%, according to the Department of Labor, Alaska Population Overview publication.

Predicting future airport operations for smaller communities in Alaska has proved difficult at best. This is because accurate records of past activities are lacking, and future traffic operations are in part dependent upon changes to the airport and potential changes in FAA regulations regarding instrument flight rules. However, because there is no other year round means of access for this community, it is reasonable to assume that aircraft operations will continue to increase concurrently with the population. The limiting factors seem to be weather, seasonally soft operating surfaces, and the runway is too short for many multiengine aircraft. Air taxi services report strong crosswinds and low visibility as significant factors affecting air traffic. It is not anticipated that air traffic will reach the level where delays would require a parallel taxiway or runway in the next 20 years. The facility does not meet current FAA criteria for the present fleet and level of service required. The improvements listed in Stage Development are driven by safety and standards deficiencies that exist now rather than projected capacity problems.

The aircraft currently serving and projected to serve Chefornak during the planning period are listed below. This information was obtained from the user survey.

CURRENT AIRCRAFT	AIRPORT REFERENCE CODE
Cessno 172	A I
Cessna 182	Αl
Cessng 206	A 1
Cessna 207	A 1
DHC-6-300 Twin Otter	A II
Piper Navajo PA-31	ВІ.
Cessna 208	ΑII
Cessna 402	ВІ
PROJECTED AIRCRAFT	
Beechcraft 18	B 1
Reechcraft C99	ВІ

There are no permanently based aircraft in Chefornak

D. STAGE DEVELOPMENT

Development of the New Chefornak Airport will be accomplished in stages of near—term (0—10 years) and long—term (11—20 years). The objective of the improvement plan is to improve safety and reliability of the airport as economically as possible. This includes using low quality on—site materials for as much of the lower levels of the embankment as possible to minimize the amount of granular surface materials that must be imported. It is understood that the stages are dependent an available funding.

Near Term (0-10 years) Development:

- 1. Construct a new 23m x 950m (75.5' x 3,116.8') gravel surfaced runway within a 36m x 1,094m (118.1' x 3,589.2') safety area. The extra 4.7m (15.5') of runway width will substantially improve wind coverage according to the wind data analysis (see Design Rationale section) at a minor cost to the overall project.
- 2. Construct a 10.5m x 63.5m (34.5' \times 208.3') gravel surfaced taxiway within a 24m (78.7') wide safety area
- 3. Construct a 5,551 sm (59,730 sf or 200.1' x 298.5') apron, an aviation support area approximately 30m by 91m (98.4' by 298.6') contiguous to the apron and 4.3m by 1,828m (14.1' x 6,004') access road with turnouts from the community.

4. Install medium intensity airport lighting.

This will be accomplished in two projects. One will place the silt embankments and a second will surface and light the airport. A curing period will occur between the two projects during which the silt embankment material will thaw and consolidate.

Long Term (11-20 years) Development:

1. Construct a new lighted 23m x 760m (75.5' x 2,493.4') gravel surfaced crosswind runway within a 36m x 904m (118.1' x 2,965.9') safety area. This is the ultimate length and will meet the FAA requirement for crosswind runway length based on 80% of the ultimate main runway length. The wind coverage on this runway alone is 80.4% while the other runway provides 87.7%. Combined coverage for both runways is 96.1%

This may also be accomplished in two projects like the construction of the main runway allowing the local sit to thaw and consolidate before applying the imported gravel surface and installing lighting.

2. Periodically re-grade and resurface the embankments.

E. DESIGN RATIONALE

Major problems affecting the use of the airport are: lack of adequate wind coverage (wind coverage based on the 10.5 knot (12 mph) crosswind component is 78.8%); the existing 12.2m x 792.5m (40? x 2600?) runway is narrow and short; the apron is too small and close to the runway, the school fronts on the apron and children play on the apron and runway, and the runway surface is soft. In short the current airport does not meet current FAA safety standards for the A I, A II or B I aircraft currently using it. It is not feasible to expand the existing facility to solve these problems because of existing community development.

The approach surfaces are based on ultimate nonprecision instrument approaches assuming greater than 1 mile visibility. The FAR Part 77 imaginary surfaces applied to this airport are based on other than a utility airport at the request of Matt Freeman of FAA. This results in approach surface slopes of 34:1 and a 10,000' horizontal surface radius. However, the RPZs are based on those listed AC 150/5300-13 for aircraft in approach categories A & B for visual and not lower than 1 mile. They are 300 m by 150 m by 210 m (1,000' by 500' by 700').

1. WIND COVERAGE

W ind data was collected near the existing runway by the University of Alaska Fairbanks, Water Research Center, for the period from March 1996 through June 1998. This data is shown graphically on the ALP within the wind rose. Wind direction and speed are variable enough so that optimum runway alignment based on the 10.5 knot crosswind component yields only 78.8% coverage. The resulting alignments of the main and crosswind runways shown on the ALP were selected to provide the best wind coverage given terrain constraints.

Fatur

The main and crosswind runway alignments provide wind coverage as follows:

MAIN RUNWAY AT 176° AZIMUTH 18.3 m 23 m PEINWAY WINTH 13 knot CROSSWIND COMPONENT 10.5 knot 87.8% PERCENT COVERAGE 78.8% CROSSWIND RUNWAY AT 60" **AZIMUTH** 18 3 m 23 m RUNWAY WIDTH 10.5 knot 13 knot CROSSWIND COMPONENT 69.4% 80.4% PERCENT COVERAGE COMBINED COVERAGE 18.3 m 23 m RUNWAY WIDTH 10.5 knot 13 knot CROSSWIND COMPONENT 96.1% 92.2% PERCENT COVERAGE

The design aircraft is B I. The design dimensions of the runways are based on upgrading the airport layout to the next higher airport reference code in order to meet the minimum FAA recommended wind coverage on an annual basis.

The staged construction plan will provide a single runway in the near term, which will provide annual 13 knot wind coverage of 87.7%. This is an improvement over the existing coverage which is 78.8% on an annual basis. Actual wind coverage is probably less than this since the analysis assumes at least an 18 m (60') wide runway whereas the existing is only 12.2 m (40') wide.

APRON

The Alaska Aviation System Plan recommends the apron be at least 5,574 sm (60,000 sf). An aviation support area at least 30m (98.4') deep should be developed contiguous with the apron. This configuration works well to accommodate future expansion at inaccessible bush communities. The aviation support area should be large enough to accommodate at least three lease lots approximately 30m by 46m (98.4' by 150.9').

In the Assurance for Airport Sponsors, Appendix 1, Order 5100.38A (c.24; pg. 12), FAA requires the airport sponsor to make the airport as self—sustaining as possible. There are few opportunities for revenue generation at bush community airports. It is prudent to develop lease lots to grade with the apron during initial construction to keep them affordable. Construction of lots outside of the project requires remobilizing equipment and crews from outside of the community, reopening materials sources, and purchasing and barging small quantities of surfacing materials. The economy of scale is lost. For these reasons, the apron is designed to allow for five aircraft tie downs, a cargo and passenger loading area, taxiliane and ground transportation itinerant parking. The lotter is expected to remain low volume. This apron configuration works well for small, rural airports where one apron serves all the airport needs. It is flexible enough to accommodate future needs as well. For example, if larger cargo aircraft such as the DC-6 (Design Group III) were to use the airport the apron dimensions are large enough to allow them to taxi and turn ground on the opron.

F. MODIFICATIONS TO STANDARDS

The runway width is based on Design Group II standards to meet the minimum FAA recommended 95% wind coverage year round. The Airport Design Advisory Circular, AC 150/5300—13, Appendix 1, Wind 3 Analysis, states that; At locations where provision of a crosswind runway is impractical due to severe terrain constraints, consideration may be given to increasing operational tolerance to crosswinds by upgrading the airport layout to the next higher airport reference code. Using Design Group I standards, the wind study shows a need for more than two runways to meet minimum FAA recommended 95% coverage. The lack of good foundation and surfacing materials does not allow economical construction of more than two. Embankments are costly to build and maintain on tundra. All surfacing materials must be barged to Chefornok. It is impractical to construct more than two runways to provide the required wind coverage. A widened runway surface is a practical solution to meeting wind coverage requirements.

G COORDINATION

This plan was developed from inception cooperatively with the community of Chefornak and users. Several public meetings were held in Chefornak culminating in signed resolutions from all governmental entities of Chefornak in layor of this plan.

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DATE:
1/26/99

AIRPORT LAYOUT PLAN APPROVED
BY LETTER DATED: Jung 27 1989

Balan Jahan

AIRPORTS DIVISION

ALASKAN REGION, MIL-600

AIRSPACE REVIEW # 99AAL-033NRA

BY DATE REVISIONS

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
CENTRAL REGION

Kille

DESIGN SECTION CHIEF

DATE 1/25/99
DESIGN PKS

DRAWN CAT
CHECKED PDM

CHEFORNAK AIRPORT

NARRATIVE REPORT

AIRPORT LAYOUT PLAN

SHEET 9

9